

CLAIMS

1. (Amended) An illuminating device comprising

a first light source for radiating light rays of a first prime color, a second light source for radiating light rays of a second prime color and a third light source for radiating light rays of a third prime color, said first, second and third light sources being arranged in the same plane;

respective optical means for collimating light rays, contained in said light rays of the first prime color, radiated from said first light source, said light rays of the second prime color, radiated from said second light source and in said light rays of the third prime color, radiated from said third light source; and

color mixing means for color mixing said light rays of the first prime color, said light rays of the second prime color and said light rays of the third prime color, radiated from said optical means, by selective transmission and reflection based on optical properties of the light rays of the respective prime colors to form white light, and for radiating said white light.

2. The illuminating device according to claim 1 further comprising

an optical component operating so that, when light rays mixed into white light by said color mixing means are incident on a light incident surface of a light guide plate, adapted for guiding the light incident from said light incident surface as said light undergoes total reflection between a light radiating surface and a light reflecting surface as one and the other of the major surfaces of said light guide plate, and for radiating the light thus guided with in-plane light radiation from said light

radiating surface, said white light radiated from said color mixing means will be guided by said optical component so that the totality of said white light will be incident on said light incident surface of said light guide plate.

3. The illuminating device according to claim 1 wherein said first, second and third light sources are light emitting diodes (LEDs).

4. (Amended) An illuminating device comprising

a first light source for radiating light rays of a first prime color, a second light source for radiating light rays of a second prime color and a third light source for radiating light rays of a third prime color, said first, second and third light sources being arranged in the same plane;

a first lens for refracting divergent light rays contained in said light rays of the first prime color radiated from said first light source to form collimated light rays;

a second lens for refracting divergent light rays contained in said light rays of the second prime color radiated from said second light source to form collimated light rays;

a third lens for refracting divergent light rays contained in said light rays of the third prime color radiated from said third light source to form collimated light rays;

a first triangular prism having a first light reflecting surface for reflecting said light rays of the first prime color radiated via said first lens;

a second triangular prism having a second light reflecting surface for

reflecting said light rays of the second prime color radiated via said second lens;

9. The illuminating device according to claim 4 wherein said first lens, second lens and the third lens are spherical or aspherical lenses.
10. The illuminating device according to claim 4 wherein said first lens, second lens and the third lens are provided with Fresnel lenses on light incident surfaces thereof.
11. The illuminating device according to claim 4 wherein said first light source, second light source and the third light source are light emitting diodes (LEDs).
12. (Amended) An illuminating device comprising
 - a first light source radiating light rays of a first prime color, a second light source radiating light rays of a second prime color and a third light source radiating light rays of a third prime color, said first, second and third light sources being arranged in the same plane;
 - a fourth light source radiating light rays of said third prime color;
 - a first lens diffracting divergent light rays contained in said light rays of the first prime color radiated from said first light source to form collimated light;
 - a second lens diffracting divergent light rays contained in said light rays of the second prime color radiated from said second light source to form collimated light;
 - a third lens diffracting divergent light rays contained in said light rays of the third prime color radiated from said third light source to form collimated light;
 - a fourth lens diffracting divergent light rays contained in said light rays of the third prime color radiated from said fourth light source to form collimated light;

a first triangular prism having a first light reflecting surface reflecting said

surfaces being arranged so as to be confined within said light incident surface of said light guide plate.

17. The illuminating device according to claim 12 wherein said first lens, second lens, third lens and the fourth lens are spherical or aspherical lenses.

18. The illuminating device according to claim 12 wherein said first lens, second lens, third lens and the fourth lens are provided with Fresnel lenses on light incident surfaces thereof.

19. The illuminating device according to claim 12 wherein said first light source, second light source, third light source and the fourth lens are light emitting diodes (LEDs).

20. (Amended) An illuminating device comprising

a first light source radiating light rays of a first prime color, a second light source radiating light rays of a second prime color and a third light source radiating light rays of a third prime color, said first, second and third light sources being arrayed in the same plane;

a first lens diffracting divergent light rays contained in said light rays of the first prime color radiated from said first light source to form collimated light;

a second lens diffracting the divergent light rays contained in said light rays of the second prime color radiated from said second light source to form collimated light;

a third lens diffracting divergent light rays contained in said light rays of the third prime color radiated from said third light source to form collimated light;

a first reflecting plate having a light reflecting surface reflecting said light

light radiating surface of said optical plate radiating said white light.

33. (Amended) A backlight device including a light guide plate guiding the light rays incident thereon from a light incident surface thereof as said light rays undergo total reflection on a light radiating surface and a light reflecting surface as one and the other of the major surfaces of the light guide plate, said light guide surface radiating the light rays by in-plane light radiation from said light radiating surface, said backlight device comprising

a plurality of illuminating devices provided at a preset interval on the light incident surface side of said light guide plate, said illuminating devices each including

a first light source for radiating light rays of a first prime color, a second light source for radiating light rays of a second prime color and a third light source for radiating light rays of a third prime color, said first, second and third light sources being arrayed in the same plane;

respective optical means for collimating light rays, contained in said light rays of the first prime color, radiated from said first light source, said light rays of the second prime color, radiated from said second light source and in said light rays of the third prime color, radiated from said third light source; and

color mixing means for color mixing said light rays of the first prime color, said light rays of the second prime color and said light rays of the third prime color, radiated from said optical means, by selective transmission and reflection, based on optical properties of the light rays of the respective prime colors, and for radiating

of said light guide plate is one of lateral sides.

39. The backlight device according to claim 33 wherein a light diffusing area is provided on said light incident surface of said light guide plate for changing the directivity of said white light obtained on color mixing by said color mixing means of said illuminating device so that said white light is diffused along the in-plane direction of said light guide plate.

40. The backlight device according to claim 39 wherein said light diffusing area is formed by bonding a light diffusing sheet and a prism sheet in superposition on said light incident surface of said light guide plate.

41. The backlight device according to claim 39 wherein a reflecting area is provided in a region other than said light diffusing area on said light incident surface for reflecting the white light guided in said light guide plate so that said white light guided will not leak outward from said light guide plate.

42. The backlight device according to claim 41 wherein said reflecting area is formed by bonding a reflective sheet in position.

43. (Amended) A backlight device including a light guide plate guiding the light rays incident thereon from a light incident surface thereof as said light rays undergo total reflection on a light radiating surface and a light reflecting surface as one and the other of the major surfaces of the light guide plate, said light guide surface radiating the light rays by in-plane light radiation from said light radiating surface, said backlight device comprising

a plurality of illuminating devices provided at a preset interval on the light incident surface side of said light guide plate, said illuminating devices each including

a first light source for radiating light rays of a first prime color, a second light source for radiating light rays of a second prime color and a third light source for radiating light rays of a third prime color, said first, second and third light sources being arrayed in the same plane;

a first lens for refracting divergent light rays contained in said light rays of the first prime color radiated from said first light source;

a second lens for refracting divergent light rays contained in said light rays of the second prime color radiated from said second light source;

a third lens for refracting divergent light rays contained in said light rays of the third prime color radiated from said third light source;

a first triangular prism having a first light reflecting surface for reflecting said light rays of the first prime color radiated from said first lens;

a second triangular prism having a second light reflecting surface for reflecting said light rays of the second prime color radiated from said second lens; and

a dichroic prism having a first wavelength selecting transmitting/ reflecting surface and a second wavelength selecting transmitting/ reflecting surface, arranged for intersecting each other in the configuration of a letter X, said first wavelength

selecting transmitting/ reflecting surface transmitting said light rays of the third

surface for reflecting the white light guided in said light guide plate so that said white light guided will not leak outward from said light guide plate.

57. The backlight device according to claim 56 wherein said reflecting area is formed by bonding a reflective sheet in position.

58. (Amended) A backlight device including a light guide plate guiding the light rays incident from a light incident surface of the light guide plate as said light rays undergo total reflection by a light radiating surface and a light reflecting surface as one and the other of the major surfaces of the light guide plate, said light guide surface radiating the light rays by in-plane light radiation from said light radiating surface, said backlight device comprising

a plurality of illuminating devices provided at a preset interval on the light incident surface of said light guide plate, said illuminating devices each including

a first light source for radiating light rays of a first prime color, a second light source for radiating light rays of a second prime color and a third light source for radiating light rays of a third prime color, said first, second and third light sources being arrayed in the same plane;

a fourth light source for radiating light rays of said third prime color;

a first lens for refracting divergent light rays contained in said light rays of the first prime color radiated from said first light source;

a second lens for refracting divergent light rays contained in said light rays of the second prime color radiated from said second light source;

a third lens for refracting divergent light rays contained in said light rays of

68. The backlight device according to claim 58 wherein said light incident surface of said light guide plate is one of lateral sides thereof.
69. The backlight device according to claim 58 wherein a light diffusing area for changing the directivity of said white light obtained on color mixing by said color mixing means of said illuminating device so that said white light is diffused along the in-plane direction of said light guide plate is provided on said light incident surface of said light guide plate.
70. The backlight device according to claim 69 wherein said light diffusing area is formed by bonding a light diffusing sheet and a prism sheet in superposition on said light incident surface of said light guide plate.
71. The backlight device according to claim 69 wherein a reflecting area for reflecting the white light guided in said light guide plate so that said white light guided will not leak outward from said light guide plate is provided in a region other than said light diffusing area on said light incident surface.
72. The backlight device according to claim 71 wherein said reflecting area is formed by bonding a reflective sheet in position.
73. (Amended) A backlight device including a light guide plate guiding the light rays incident from a light incident surface of the light guide plate as said light rays undergo total reflection by a light radiating surface and a light reflecting surface as one and the other of the major surfaces of the light guide plate, said light guide surface radiating the light rays by in-plane light radiation from said light radiating

surface, said backlight device comprising

a plurality of illuminating devices provided at a preset interval on the light incident surface side of said light guide plate, said illuminating devices each including

a first light source for radiating light rays of a first prime color, a second light source for radiating light rays of a second prime color and a third light source for radiating light rays of a third prime color, said first, second and third light sources being arrayed in the same plane;

a first lens for refracting divergent light rays contained in said light rays of the first prime color radiated from said first light source;

a second lens for refracting divergent light rays contained in said light rays of the second prime color radiated from said second light source;

a third lens for refracting divergent light rays contained in said light rays of the third prime color radiated from said third light source;

a first reflecting plate having a light reflecting surface for reflecting said light rays of the first prime color radiated via said first lens;

a first beam splitter plate having a first wavelength selecting transmitting/reflecting surface which transmits light rays of the first prime color reflected by said light reflecting surface possessed by said first reflecting plate and which reflects said light rays of the second prime color radiated via said second lens;

a second beam splitter plate having a second wavelength selecting

transmitting/ reflecting surface which transmits light rays of the third prime color